1920

American Electrochemical Society

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AMERICAN ELECTROCHEMICAL SOCIETY

The Spring Meeting, held at Boston, April 8 to 10, 1920, was one of the best meetings of recent years. A well-prepared program of nearly fifty papers was the main attraction, supplemented by visits to plants and social features of unusual drawing power. As a result, over two hundred and fifty members of the Society signed the register, and all the features of the meeting were well attended.

Over forty of the papers were available as preprints, thus adding materially to their intelligent discussion, and rendering unnecessary the tedious reading of papers *in extenso* by a laboring author to a usually bored audience.

The sessions of Friday, April 9, were held jointly with the American Institute of Electrical Engineers.

The Thursday session, held in Huntington Hall, Rogers Building, one of the old "Technology" buildings, opened with the annual business meeting of the Society. Professor Talbot welcomed the visitors on behalf of the Institute. The treasurer's report showed that income just about balanced expenditures in 1919, even when including under the latter item $2,000 invested in Victory Loan bonds. With annual dues still at five dollars, the Society is certainly establishing for itself an enviable record for economical management in these days of strenuous financing to meet the acid test of H. C. L. The secretary's report showed an increase of membership in 1919 of 306, due largely to the successful activity of Mr. Schluederberg, chairman of the membership committee. The present membership is over 2400.

The tellers of election reported on the voting for new officers as follows:

President: W. S. Landis, Chief Technologist of the American Cyanamid Company.

Vice Presidents: J. A. Mathews, President of the Holcomb Steel Company, L. E. Saunders, Manager of Abrasive Plants of the Norton Company, A. T. Hinckley, Chemist of the National Carbon Company.

Managers: Colin G. Fink, Research Director of the Chile Exploration Company, Acheson Smith, President of the Acheson Graphite Company, H. B. Coho, Business Engineer of the National Lead Company.

Treasurer: P. G. Salom, of Philadelphia.

Secretary: J. W. Richards, Professor of Metallurgy at Lehigh University.

The question of the Society's approving the establishment of the metric system as the only legal standard of weights and measures in the United States was brought up and by motion referred to a referendum of the Society, as a guide to the Board of Directors in taking action for the Society. President Bancroft announced the death, in February, of Prof. H. S. Carhart, who was the second president of the Society in 1904–5.

The scientific business of the meeting began with an address by the retiring president, Prof. Bancroft, on "Contact Catalysis," which reviewed thoroughly the history and present status of this knotty problem. It will be found intensely interesting by everyone seeking light on these little understood phenomena. This was followed by a "Symposium on Colloid Chemistry," which contained some notable contributions. Hulett and Nelson, in a long and brilliant paper, brought forward experimental proof that so-called graphitic acid is a colloidal oxide of carbon. They assign it the formula C_4O or $C_{11}O_8$, and describe its properties. Selvig and Ratliff, of the Bureau of Mines (Pittsburgh), discussed the analytical determination of graphitic carbon in various materials. W. C. Moore described examples of selective adsorption by the bacteria *B. pyocyaneus*—an essentially colloidal action. W. A. Deane, of the Dorr Concentrator Company, discussed at length "settling" problems, showing how they involved the detailed utilization and application of all the information we possess about the principles of colloid chemistry; in fact, the practical observations of Mr. Deane go far to explain some so-far unexplained colloid phenomena, such as the stratification of settling solutions. Mr. Deane has made a splendid contribution to applied colloidal chemistry. The other papers presented at this session were: Goodwin and Knobel, on the effect which alternating current, superposed on direct current, has on the over-voltage of hydrogen; Holler and Ritchie, on the concentration of hydrogen ions in dry cells, and its effect on the voltage of the cells; MacInnes, Adler and Joubert on the exact chemical reactions taking place in the lead accumulator, in which they proved that no higher oxide than PbO_2 is formed; Wm. R. Mott, on flame colorations and condensed coatings obtained by introducing substances into the arc. The last paper dealt with several new methods of detection of elements, particularly the rarer ones, and is highly commended as rich in new analytical data of wide practical application.

After lunch, taken in the Walker Memorial Building at the new Institute of Technology group in Cambridge, the afternoon session was held in one of the numerous fine lecture rooms, the particular one selected happening to have "Faraday" inscribed over its portal. With an assembly which taxed the capacity of the hall, many students of "Tech" and Harvard being present, the following papers were read and discussed: W. S. Landis, on the new cyanide formed by fusion of calcium cyanamide with salt and some calcium carbide, in a quick-melting electric furnace, forming a mixture of calcium chloride and sodium cyanide (25 to 40 per cent of the latter), which is sold and used for its cyanide content only; C. J. Rottman, on exact and quick determination of carbon in ferro-alloys—a difficult analytical problem, and T. D. Yensen, on a new method of determining carbon in iron, consisting in condensing the carbon dioxide produced in liquid air and afterwards evaporating the solidified carbon dioxide in an evacuated space, the pressure produced allowing determination of the carbon in the specimen to 0.001 per cent; L. T. Richardson, on the influence of enclosed slag on causing corrosion of iron, showing that it has practically no influence; Langdon and Grossman, on the effect of sand-blast cleaning and acid pickling on the properties of steel, showing a decided decrease of its resistance to rapid alternating stresses; C. H. Brace, on the details of producing calcium electrolytically on a commercial scale, in a special form of fused-salt electrolyzing apparatus; G. J. Sargent, on electrolytic chromium plating, showing how deposits up to one centimeter thickness have been obtained; Mathers and Sowder, on bronze plating, describing two baths which work industrially; Hartman, Hougen and Kobler, of the Carborundum Company, on the resistance of twelve different special refractory materials to spalling, as tested by spraying when hot with cold water, and to abrasion, as tested when hot by grinding against a cold carborundum wheel. Several of the above papers led to lively discussion, particularly that on the corrosion of iron.

After this session, many of the visitors were guided through the magnificent new buildings of the Institute, while a considerable number stayed behind discussing with the Electric Furnace Association the training of men for running electric furnaces. This topic was discussed with great fervor until it was time to adjourn for dinner.

In the evening, Arthur D. Little, Inc., was host to the Society at its model industrial research laboratories in Cambridge. The museums, library, laboratories and semi-commercial plant in the basement were admired by a gathering which literally filled the building. Later, there were speeches and singing and a good deal of fun, with unlimited smokes, and Professor Armstrong, of the Institute, entertained most charmingly with a pictorial account of hunting with a camera in the wilds of New Brunswick. He delighted and enthused his audience by his breezy account of a most fascinating summer vacation.

Friday was set for joint sessions with the American Institute of Electrical Engineers. The program was a morning session with a Symposium on Electrically Produced Alloys, an afternoon trip to the General Electric Works at Lynn, an informal subscription dinner, followed by an evening session with a Symposium on Power for Electrochemical Purposes. President Bancroft was chairman at the morning session, and President Townley of the Electrical Engineers, in the evening. The 250 electrochemists, together with about 150 electrical engineers, crowded the meeting place—the Swiss Room of the Copley Plaza Hotel—to its full capacity, discussion was active, and the occasion was indeed a notable one.

At the morning session, in the Symposium on Electrically Produced Alloys, the following papers were read and discussed: H. E. Howe, a review of the fundamental problems in alloys research, particularly reciting the physical and chemical data which are needed for thoroughly studying alloys and alloying phenomena; R. J. Anderson and C. B. Gibson each discussed the broad outlines of the ferro-alloy industry, its rise and present commercial importance, and the technique of the general problem of producing ferro-alloys; B. D. Saklatwalla described the ferrovanadium industry, giving occasion for some pungent discussion of the limits of supply of vanadium and its commercial exploitation; F. A. Raven described the physical properties and chemical uses of ferrosilicon; E. S. Bardwell, ferromanganese; Alcan Hirsch, ferrocerium; R. M. Major, nickel chromium and similar alloys; R. C. McKenna, on producing high tungsten high-speed steel in the electric furnace, resulting in considerable discussion of the best form of electric furnace for getting a good mixture of these slowly alloying metals; E. Haynes, on cobalt-chromium alloys, known as stellite, used as high-speed cutting tools and for surgical instruments; T. D. Yensen, on the magnetic and electric properties of iron-nickel alloys; Hunter and Bacon on similar properties of iron-titanium alloys. Finally, C. F. Harding related his experiments in fixing the nitrogen of the air by a silent discharge process which is at present of very low efficiency (one per cent) but which contains the promise of better things.

The trip to Lynn was made in eight electric cars, directly from and returning to Copley Square, both societies being invited guests of the General Electric Company. A printed itinerary gave all the details of the visit with great accuracy, and it was carried out according to plan with military precision. While duly impressed by the magnitude of the Lynn plants, some of the more critical visitors were not as favorably impressed by the details of execution of the work in some parts of the plants; the Heroult electric steel furnace, however, appeared to be casting steel dead—melted "to the queen's taste;" this operation was given unstinted commendation.

The informal dinner was attended by about a hundred and fifty, and was graced by the presence of our life-long friend, Professor Elihu Thompson.

The evening session was almost a crush. The Symposium

on Power for Electrochemical Purposes was calculated to draw out every electrical engineer and every electrochemist within possible reach of Boston. Chairman Townley divided the program into three groups, *viz.*, papers treating on the general question, discussion of specific electric furnace requirements, and presentation of the advantages of specific power sites. In the first class came the following: J. L. Harper, discussing the general requirements of power by electrochemical industries of various kinds; E. A. Wilcox, on the central station man's view of electrochemical customers and their requirements; A. Smith, on abuse of power demands by electric furnace operators, in particular the necessity of controlling excessive surges on the lines. In the second class, H. L. Hess discussed the requirements of electric steel furnace plants; H. A. Winne the use of reactors on electric furnace circuits to reduce the momentary surges or peaks in the power demands; J. A. Seede, on automatic controllers for regulating arc furnace electrodes so as to stabilize the current. In the third class of papers, C. T. Maynard described the power available at Rumford Falls, Maine, only two hundred miles from Boston; F. F. Fowler, the water powers of the Pacific Coast, developed and potential; J. W. Beckman, the power developments of Norway and Sweden, showing how far these countries have out-distanced the United States in developing their power for electrochemical industries.

The Saturday morning session in the new Lecture Hall at Harvard University was lively and interesting. Professor T. W. Richards—"Atomic Weights" Richards—gave the visitors a hearty greeting. The proceedings included the following: J. W. Richards—"Metallurgical Calculations" Richards—described the Söderberg self-baking, continuous electrode, which is already extensively used in Europe and is being installed on some ferrosilicon furnaces at Anniston, Alabama; C. A. Keller's paper on synthetic, electric-furnace pig iron, described the great importance this product attained in France during the war, in utilizing steel turnings and producing cast-iron shells; E. F. Kern described experiments on reducing manganiferous silicate slags in an electric furnace to silico-spiegel; P. B. Short, a step-induction regulator of new form for electric furnaces; C. J. Weed, the general application of the electric furnace to metallurgy; L. B. Lindemuth described in detail the position of the electric furnace in manufacturing steel, concluding that it is the most flexible and most generally useful of all steel-making apparatus; H. M. St. John, on the evolution of the electric brass furnace. Some statements in the last paper as to advantages and power required for melting brass were questioned by Mr. Winder, giving rise to a very lively interchange of opinion between Messrs. Gillette, Baily, FitzGerald, Hering, Richards, and others, which, in general, substantiated the statements in the paper.

After the session, Professor Richards invited those present to inspect the Gibbs Research Laboratory, which opportunity was eagerly accepted. Lunch followed at the Harvard Union, and then a visit to the Huff Electrostatic Separator plant at Arlington closed the program. The visitors found the last item very instructive and interesting.

Thus Boston and the Electrochemical Society came together for the third time, to their mutual profit and advantage.

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